

REMARKS

The specification has been amended to provide appropriate headings and to correct minor errors. A substitute Abstract of Disclosure has also been provided in proper form.

Copies of Figs. 1, 2 and 3 are submitted here with showing the proposed labeling of these Figs. as "PRIOR ART". Upon approval, the drawings will be corrected in accordance with the proper procedures.

In the last Office Action, claim 1 was rejected under U.S.C. §112 second paragraph as being indefinite. Claim 1 was further rejected under 35 U.S.C. §102 as being anticipated by Illing. It is noted that the Evans et al. reference was referred to in the last paragraph on page 2 of the Office Action. However, this reference was not listed on Form PTO-892 and a copy of the reference was not provided. A copy of the reference is respectfully requested.

Claim 1 has been cancelled without prejudice in order to advance the prosecution of the present Application and new claim 2 has been substituted therefor. New claim 2 is believed to be in full compliance with 35 U.S.C. §112 and accordingly reconsideration and allowance of the Application are respectfully requested in view of the following remarks.

In many oil wells the production is accomplished by continuous gas-lift and a valve is commonly used in the working of the well which is referred to as a gate valve. This is the valve which lets

in gas from between the annulus and the projection pipe into the production pipe.

Such gate valves consist primarily of a gate which is pre-set at a given diameter which does not change as long as the valve is within the well. Such a valve is not opened and closed by means of a movable valve member but is continuously open for regulating the gas flow through the valve. The valve of the present invention is applied in a continuous gas-lift producing well in order to obtain a homogeneous flow of gas.

The gas-lift valve primarily used in the past, consists of a common valve containing an orifice plate such as that disclosed in Figs. 1-3 of the present Application. The valve does not have a seat per se, since the valve does not require a seat to "close the valve". The Prior Art valve, as shown in Fig. 3, is inefficient since a great energy loss occurs due to the "eddies" or "swirls" in the region adjacent the orifice.

The gas-lift valve of the present invention is not intended to control the flow through an orifice since the valve works all the time in the "open" position. In order to allow the gas to pass from the casing to the tubing, it is necessary to keep the pressure differential between the tubes constant. Thus, this type of valve does not need a specific seat which cooperates with a moveable valve member to "close" the valve.

A gas-lift valve provided with the specific geometry according to the present invention as shown in Fig. 4, has never been used in

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the gas lift process. Although the broad concept of using a venturi-shaped passage is old and well-known in other areas as evidenced by the patent to Illing, the configuration has never been applied to a continuously open gas-lift valve. Illing, in fact, does not have a true venturi-shaped opening, in as much as Illing provides a shoulder 16 having a seating surface between the curved inlet portion and the straight intermediate portion for seating the movable valve member 12. Such a shoulder would seriously disrupt the flow of gas insofar as the present invention is concerned.

New claim 2 specifically sets forth that the gas-lift valve consists of a housing and a valve seat mounted in the housing. Therefore the valve as claimed does not have any other components, namely a moveable valve member, which would require a specific seat. The claim further specifies that the valve seat has a continuously open passage through which gas is allowed to flow and that the passage consists of a curved inlet portion defining a nozzle in which gas flow is speeded up, the straight intermediate portion providing a main restriction for gas flow and an outwardly tapered conical shaped outlet portion in which the gas flow is gradually slowed down. Thus, there can be no other components such as the stepped-shoulder between the inlet portion and the intermediate portion. Since the patent to Illing only discloses the valve seat member as having such a step shoulder for use in combination with a moveable valve member, it is submitted that claim 2 is not anticipated by Illing. Furthermore, it would

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not be obvious to one skilled in the art to modify Illing, to arrive at the presently claimed construction since Illing is only concerned with a valve having a valve seat and a movable valve member. There is no suggestion whatsoever of using the valve seat of Illing as a gas-lift valve in a gas lift producing oil well. Therefore, it is respectfully requested that claim 2 be allowed and the Application passed to issue forthwith.

If for any reason the Examiner is unable to allow the Application on the next Office Action and feels that an interview would be helpful to resolve any remaining issue, the Examiner is respectfully requested to contact the undersigned attorney for the purpose of arranging such an interview.

Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this case, and any required fee for such extension is to be charged to Deposit Account no. 19-4880.

Respectfully submitted,



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